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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/829,010	04/21/2004	Wen-Hsi Lee	9751.105US11	5986

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EXAMINER
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MAYES, MELVIN C

ART UNIT	PAPER NUMBER
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1734

DATE MAILED: 11/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/829,010

Applicant(s)

LEE ET AL.

Examiner

Melvin Curtis Mayes

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19, 22, 25, 28 and 29 is/are rejected.
- 7) ☒ Claim(s) 20, 21, 23, 24, 26 and 27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 10/224,949.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 4/21/04.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

(1)

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

(2)

Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 10 recites the limitation "constraining layer (L<sub>3</sub>) positioned on the top **or bottom**" in line 3. There is insufficient antecedent basis for this limitation in the claim. Claims 1 and 4 from which Claim 10 depends only claims a constraining layer on the top or between layers.

### ***Claim Rejections - 35 USC § 102***

(3)

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(4)

Claims 1-17, 19, 25, 28 and 29 are rejected under 35 U.S.C. 102(a) as being anticipated by Knickerbocker et al. 6,607,620.

Knickerbocker et al. disclose a method of process greensheets comprising: providing a laminate (monolithic structure) by providing greensheets 20 having active areas 28 screened and patterned by applying conductive paste into vias and onto the surface to form conductive lines and vias after sintering (active area comprising heterogeneous material pattern of heterogeneous material component), and stacking at least two of the greensheets (dielectric layers and cover layers) with frames 24 such that frames are on the top of the laminate and between greensheets to constrain movement including shrinkage of the greensheet within the frame area during stacking and laminating (constraining layer), the frame having openings (windows) of any desired size wherein the edge of an active area of each greensheet is within an opening of the frame; sintering the laminate; and cutting away the frame along cut lines 36 after sintering to produce a plurality of products, the cut lines located between the frame members of the frames and the active areas, the cutting by saw blades or laser cutting. Frames can also be provided to the opposite surfaces of the greensheets. The frames comprise material such a metals, polymer, ceramic, cellulosic or composites, such as nickel frame for glass-ceramic greensheets. For a greensheet thickness of 0.006 inches and frame thickness of 0.005 inches, when a laminate is made of two greensheets is made, the ratio of the total thickness of the greensheets (dielectric body) to the thickness of a frame on the greensheets is 2.4, less than 3.5 (col. 1-5).

***Claim Rejections - 35 USC § 103***

(5)

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

(6)

Claims 1-19, 22, 25, 28 and 29 rejected under 35 U.S.C. 103(a) as being unpatentable over Knickerbocker et al. 6,607,620 in view of Flaitz et al. 5,130,067.

Knickerbocker et al. disclose a method of processing greensheets to make a ceramic substrate comprising: providing a laminate (monolithic structure) by providing greensheets 20 having active areas 28 screened and patterned by applying conductive paste into vias and onto the surface to form conductive lines and vias after sintering (active area comprising heterogeneous material pattern of heterogeneous material component), and stacking at least two of the greensheets (dielectric layers and cover layers) with frames 24 such that frames are on the top of the laminate and between greensheets (alternating) to constrain movement including shrinkage of the greensheet within the frame area during stacking and laminating (constraining layer), the frame having openings (windows) of any desired size wherein the edge of an active area of each greensheet is within an opening of the frame; sintering the laminate; and cutting away the frame along cut lines 36 after sintering to produce a plurality of products, the cut lines located between the frame members of the frames and the active areas, the cutting by saw blades or laser cutting. Frames can also be provided to the opposite surfaces of the greensheets. The frames comprise material such as metals, polymer, ceramic, cellulosic or composites, such as nickel frame for glass-ceramic greensheets or greensheet ceramic materials. For a greensheet thickness of 0.006 inches and frame thickness of 0.005 inches, when a laminate is made of two greensheets is made, the ratio of the total thickness of the greensheets (dielectric body) to the thickness of a frame on the greensheets is 2.4, less than 3.5 (col. 1-5). Knickerbocker et al. do not

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disclose reducing shrinkage during sintering of the glass-ceramic greensheets by applying Z-direction pressure during firing.

Flaitz et al. teach that X-Y shrinkage is controlled and X-Y distortion and Z-direction camber are eliminated during co-sintering ceramic/metal multilayered ceramic substrate by applying Z-direction force during sintering (col. 4, lines 44-68).

It would have been obvious to one of ordinary skill in the art to have modified the method of Knickerbocker et al. for making a multilayer ceramic substrate by applying Z-direction force to the glass-ceramic laminate during sintering, as taught by Flaitz et al., to control X-Y shrinkage and eliminate X-Y distortion and Z-direction camber.

Providing the frames (constraining layers) of alumina, as claimed in Claims 18, would have been obvious to one of ordinary skill in the art, as Knickerbocker et al. disclose that the frames can comprise greensheet ceramic materials, and alumina is a well known greensheet ceramic material.

***Allowable Subject Matter***

(7)

Claims 20, 21 23, 24, 26 and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

(8)


The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(9)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melvin Curtis Mayes whose telephone number is 571-272-1234. The examiner can normally be reached on Mon-Fri 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Fiorilla can be reached on 571-272-1187. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Melvin Curtis Mayes  
Primary Examiner  
Art Unit 1734

MCM  
November 1, 2005